

# PELVIC MUSCLE EXERCISE DEVICE

## Background of the Invention

### 5 1. Field of the Invention

The present invention relates to an exercise device for exercising pelvic floor muscles.

### 2. Related Art

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Muscles of the pelvic floor stretch from the pubic bone to the tailbone. These muscles surround the opening of the urethra, vagina and the bowel and support the organs of the pelvic region, which include the bladder, rectum, and the uterus. Also, the muscles of the pelvic floor are involved in human sexual response and are also important for  
15 controlling the evacuation of the bowel and the bladder.

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The pelvic muscles may become damaged or weakened through child birth, lack of use, age or other reasons. One of the symptoms related to a weakening of these muscles is urinary incontinence. Various exercise devices were developed in an attempt to strengthen the pelvic floor muscles with the goal of strengthening the muscles that  
20 surround the urethra to overcome urinary incontinence in women. It was discovered that strengthening these muscles also increased the patient's sexual response.

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Kegel exercises have been the first choice of prevention and treatment in patients suffering from stress urinary incontinence. The most comprehensive review of pelvic muscle exercise methods for treatment of urinary incontinence was published in 1992 by  
25 the Agency for Health Care Policy and Research (AHCPR).

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The AHCPR concluded that the uses of resistance devices to exercise pelvic muscles are 87% effective. However, the same study showed that merely squeezing the pelvic muscles without a feedback device are not effective. One reason is that only a few women can do kegal exercises correctly. This is because most women cannot identify the  
30 muscles of the pelvic region to exercise and are unable to monitor their progress and/or results.

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It is therefore desirable to provide a device to exercise the muscles of the pelvic floor that dynamically exercise the muscle groups of the pelvic region and enable the patient to monitor their progress and results.

## 5    Summary of the Invention

The present invention provides a pelvic muscle exercise device adapted to be received within a vaginal canal, for use by a patient. The device includes an elongate shaft having a forward end and a rearward end, a pressure sensitive element, wherein the pressure sensitive element is responsive to pressure applied to the exterior of the pelvic exercise device caused by the exercising of the pelvic floor muscles, and a feedback  
10    element which is responsive to a predetermined threshold from the pressure sensitive element that provides feedback to the patient.

## Brief Description of the Drawings

15    The advantage, nature, and various additional features of the invention will appear more fully upon consideration of the illustrative embodiments now to be described in detail in connection with accompanying drawings wherein:

FIG. 1A is a schematic diagram of a exercise device for use in exercising the muscles of  
20    the pelvic

FIG. 1B is a schematic diagram of a sleeve that is adapted to be received on at least a portion of the exercise device depicted in FIG. 1A

FIG. 2 is a schematic diagram of a sleeve received on a portion of an exercise device for exercising the muscles of the pelvic floor in accordance with an exemplary embodiment  
25    of the invention.

It should be understood that the drawings are for purposes of illustrating the concept of the invention and are not necessarily to scale.

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## Detailed Description of the Invention

Referring to the drawings wherein like reference numerals identify similar or like elements throughout the several views and initially to FIG. 1A there is shown an exemplary embodiment of the present invention, exercise device 10. Exercise device 10 provides feedback to a patient for assisting the patient in performing pelvic muscle exercises, thereby strengthening the pelvic floor muscles and preventing urinary incontinence. Exercise device 10 includes elongate shaft 11 having a substantially circular cross section.

Exercise device 10 includes forward end 12 and rearward end 13. Rearward end 13 includes withdrawal device 14. Withdrawal device 14 enables a patient using exercise device 10 to exercise their pelvic muscles and thereafter to withdraw device 10 from the patient's vaginal canal. Withdrawal device 14 can be any means that enables the withdrawal of exercise device 10 from the vaginal canal. For example, withdrawal means include but are not limited to string, cord, clamps or handles.

Exercise device 10 includes pressure sensitive element 15 and feedback element 16. Pressure sensitive element 15 is any device that is understood by those skilled in the art that is sensitive to external pressure applied to exterior of shaft 11 and includes but is not limited to, buttons, switches, transducers, pneumatic activated sensors and the like.

In an alternate embodiment the pressure sensitive element may have a pneumatic element which is integral to or compresses elongated shaft 11.

Feedback element 16 can be associated with shaft 11 to vibrate shaft 11 in a vaginal canal in response to pressure sensitive element 15. Feedback element 16 can be located outside a vaginal canal during operation of device 10. Alternatively, feedback element 16 can include visual, vibration movement, and audio responses that provide feedback to a patient. For example, these feedback devices are well understood by those skilled in the art and include but are not limited to visual light devices that show an increase in light or light intensity and audio feedback devices that provide an increasing audio sound as feedback.

Feedback element 16 is activated when pressure sensitive element 15 reaches and/or exceeds a preset threshold. The preset threshold is adjustable. In a further

embodiment the pressure threshold is dynamically adjusted in response to a frequency generated by pressure sensitive element 15 exceeding the threshold.

Exercise device 10 includes sleeve holding device 17. Sleeve holding device 17 can be but is not limited to raised portion 18 of exterior of shaft 11.

5        Exercise device 10 can be made of plastic or metal.

Exercise device 10 can be portable and means to power exercise device 10 can include but are not limited to batteries and electricity. Means to power devices inserted into the vaginal canal are well understood by those skilled in the art and include but are not limited to means used to power vibrators, devices used to stimulate sexual response.

10        FIG. 1B shows resilient, compressible sleeve 20. Sleeve 20 can include recessed portion 21. Sleeve 20 can be formed from an elastomeric material such as polyurethane, poly(vinyl chloride) or any other suitable material. Sleeve 20 can be replaceable and/or disposable.

FIG. 2 shows exercise device 10 and sleeve 20 according to an exemplary  
15        embodiment of the invention. Sleeve 20 is positioned on shaft 11 of exercise device 10 and recessed portion 21 of sleeve 20 is positioned on sleeve holding device 17 to keep sleeve 20 from freely moving on shaft 11 of exercise device 10.

Sleeve 20 can be resilient and compressible. In response to external pressure caused by a patient exercising their pelvic floor muscles, sleeve 20 compresses triggering  
20        pressure sensitive element 15. Pressure sensitive element 15 signals feedback element 16 providing a response to patient. As the patient's pelvic floor muscles strengthen the patient can change sleeve 20 from a more firm, less compressible sleeve to a more soft, more compressible sleeve. The patient will need less squeezing muscle action to trigger pressure sensitive element 15 with a firmer sleeve than with a softer sleeve. Dependent  
25        on the strength of the patient's pelvic muscles a sleeve may not be necessary.

It is to be understood that the above-described embodiments are illustrative of only a few of the many possible specific embodiments which can represent applications of the principles of the invention. Numerous and varied other arrangements can be readily devised in accordance with these principles by those skilled in the art without  
30        departing from the spirit and scope of the invention.